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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/730,508	12/05/2000	JiYang Yan	DP-300317	6788

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EXAMINER

ILDEBRANDO, CHRISTINA A

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 12/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/730,508

Applicant(s)

YAN ET AL.

Examiner

Christina Ildebrando

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 11-21, 25-31 and 34-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 11-13, 15-21, 25-31 and 34-45 is/are rejected.
- 7) ☒ Claim(s) 14, 46 and 47 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 36-43 are rejected under 35 U.S.C. 102(b) as being anticipated by Abe et al. with Labarge et al. (2002/0132724) cited to demonstrate an inherent state of fact.

Abe et al. (US 5,662,869) discloses an adsorbent-catalyst system useful in the purification of exhaust gases. It is taught that the catalyst-adsorbent is a layer type catalyst-adsorbent composed of a honeycomb structure having a surface layer coated with a first layer of a high silica containing zeolite such as ZSM-5, USY, or beta zeolite with a noble metal and a second layer composed of an inorganic oxide with a noble metal carried thereon and coated on the first layer (column 6, lines 40-47). It is taught that the honeycomb structure is preferably composed of cordierite (column 4, lines 45-59).

With regards to the zeolite adsorbent layer: It is taught that the zeolite may be a faujasite zeolite such as USY having an $\text{SiO}_2/\text{Al}_2\text{O}_3$ molar ratio of at least 20 (column 5, lines 20-25), which corresponds to a Si/Al atomic ratio of at least 10, which meets the instantly claimed range. It is further taught that the zeolite may be combined with an inorganic binder such as silica or alumina (column 5, lines 65-69).

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With regards to the catalyst overlayer: It is taught that the catalyst overlayer preferably contains at least one kind of a noble metal such as Pt, Pd, or Rh carried on a heat resistant inorganic oxide such as alumina (column 6, lines 15-30). The use of gamma alumina is exemplified (column 11, Example 2). It is taught that the heat resistant oxide is preferably combined with an oxide such as cerium oxide or lanthanum oxide (column 6, lines 32-36). It is taught that the carried noble metal is loaded on the catalyst layer in an amount in the range of 20-130 g/ft³ (0.0116-0.0752 g/in³) (column 6, lines 35-40). It is further taught that the catalyst layer is loaded in an amount in the range of 0.02-0.20 g/cc (0.328-3.2774 g/in³) (column 7, lines 1-7). Therefore, the non-catalyst loading amount is in the range of 0.2528-3.2658 g/in³, which overlaps the range instantly claimed. Further, Example 2 (column 11) details the preparation of a catalyst-adsorbent in which the catalyst layer has a non-catalyst loading of about 0.8 g/in³ (total catalyst element is about 0.82 g/in³ and noble metal catalyst loading is about 0.02 g/in³), which value specifically meets the range instantly claimed.

With regards to the limitation "zeolite free," Abe et al. does not disclose that the catalyst overlayer contains any zeolite. Refer to column 6, lines 40-65. Note also Example 2 which details the preparation of a Catalyst-Adsorbent in which the catalyst overlayer is zeolite free. Therefore, it is considered that the reference meets the limitation.

With regards to the limitation "wherein the zeolite has a sodium content of less than 0.1 wt%," Labarge et al. teaches that high silica content zeolites having silica to alumina ratios of 30 or more have as little as 0.05% by weight sodium sites (column 2,

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[0021]). Abe et al. exemplifies zeolites having a silica to alumina molar ratios of 280 and 100 and teaches ranges of at least 20, and preferably at least 80 (column 5). Therefore, given the silica to alumina molar ratios and specific zeolites taught by the reference, i.e. USY, it is the position of the examiner that the zeolites taught by Abe et al. would inherently have a sodium content which meets the instantly claimed range. When the examiner has reason to believe that the functional language asserted to be critical for establishing novelty in claimed subject matter may in fact be an inherent characteristic of the prior art, the burden of proof is shifted to Applicants to prove that the subject matter shown in the prior art does not possess the characteristics relied upon. *In re Fitzgerald et al.* 205 USPQ 594.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-7, 9-13, 15-21, 23-31, and 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuno et al.

Mizuno et al. (EP 0 848 984) discloses an adsorbent-catalyst system useful in the purification of exhaust gases. It is taught that the catalyst-adsorbent is a layer type catalyst-adsorbent composed of a honeycomb structure having a surface layer coated with a first layer of a high silica containing zeolite such as ZSM-5, USY, or beta zeolite

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with a noble metal (page 5, lines 45 – page 6, line 20) and a second layer composed of an inorganic oxide with a noble metal carried thereon (pages 3-4) and coated on the first layer (page 13 -14). It is taught that the honeycomb structure is preferably composed of cordierite (page 3, lines 40-45 and pages 13-14).

With regards to the zeolite adsorbent layer: It is taught that the zeolite preferably has a $\text{SiO}_2/\text{Al}_2\text{O}_3$ molar ratio of 40 or more and suitable zeolites include ZSM-5, USY, and beta zeolite (page 5, lines 50-55).

With regards to the catalyst overlayer: It is taught that the catalyst overlayer preferably contains at least one kind of a noble metal such as Pt, Pd, or Rh carried on a heat resistant inorganic oxide such as alumina (page 4, lines 1-30). The use of gamma alumina is exemplified (pages 13-14). It is taught that the heat resistant oxide is preferably combined with an oxide such as cerium oxide or lanthanum oxide (page 5, lines 2-8). It is taught that the carried noble metal is loaded on the catalyst layer in an amount in the range of 10-700 g/ft³ (page 5, lines 1-5). It is further taught that when the noble metal is palladium, the amount of palladium supported is preferably 100-300, more preferably 160-220 g/ft³ (page 4, lines 8-13).

The reference teaches by way of example the preparation of a catalyst-adsorbent (page 13-14) in which the catalyst layer has a non-catalyst loading of about 0.82 g/in³ and a catalyst loading of 0.087 g/in³. With regards to the limitation “zeolite free,” Mizuno et al. does not disclose that the catalyst overlayer contains any zeolite. Note also the specific examples of the catalyst-adsorbent in which the catalyst overlayer is zeolite free. Therefore, it is considered that the reference meets the limitation.

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The difference between the reference and the claims is that the reference does not specifically disclose the claimed combination of non-catalyst loading less than 1 g/in³ and an catalyst loading of about 0.1-0.5 g/in³, as required by claim 1. However, the reference does disclose that higher amounts of palladium or noble metal may be used (refer to page 4, lines 1-18). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have used higher amounts of noble metals than exemplified in light of the teaching by reference that such higher values are suitable and preferred.

With regards to claims 13, 14, and 27, the reference further does not exemplify the zeolite USY in combination with the non-catalyst and catalyst loadings. However, the reference does disclose that USY and beta zeolite are functionally equivalent. Therefore, it would have been obvious to one having ordinary skill in the art to substitute one known functional equivalent for the other, with a reasonable expectation of success.

5. Claims 34-40 and 42-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuno et al. as applied to claims 1-7, 9-13, 15-21, 23-31, and 44-45 above with Labarge et al. cited to demonstrate an inherent state of fact.

Mizuno et al. is applied as above for claims 1-7, 9-13, 15-21, 23-31, and 44-45 above.

With regards to the limitation "wherein the zeolite has a sodium content of less than 0.1 wt%," Labarge et al. teaches that high silica content zeolites having silica to alumina ratios of 30 or more have as little as 0.05% by weight sodium sites (column 2, [0021]). Abe et al. exemplifies zeolites having a silica to alumina molar ratios of 250 and

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teaches ranges of 40 or more (page 5). Therefore, given the silica to alumina molar ratios and specific zeolites taught by the reference, i.e. USY, it is the position of the examiner that the zeolites taught by Mizuno et al. would inherently have a sodium content which meets the instantly claimed range. When the examiner has reason to believe that the functional language asserted to be critical for establishing novelty in claimed subject matter may in fact be an inherent characteristic of the prior art, the burden of proof is shifted to Applicants to prove that the subject matter shown in the prior art does not possess the characteristics relied upon. *In re Fitzgerald et al.* 205 USPQ 594.

Allowable Subject Matter

6. Claims 14 and 46-47 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach or suggest that a catalyst composition containing a faujasite zeolite having an Si/Al ratio of about 3 to about 10, in combination with the other features instantly claimed.

Response to Arguments

8. Applicant's arguments filed August 18, 2003 have been considered but are not persuasive.

With respect to the rejection under 35 USC 102(b) over Abe et al. with Labarge et al. to demonstrate an inherent state of fact, applicant argues that the Labarge reference does not cure the deficiencies of the Abe reference because the reference does not relate sodium sites to sodium concentration. However, the Labarge reference discloses that high silica zeolites have very few sodium sites available for exchange. Because the only sodium in the zeolite would be in the exchangeable cation sites, there is a direct relationship between the available sodium sites and the sodium concentration, i.e. few sodium sites would necessarily lead to low sodium concentration. Applicant has not presented any evidence tending to rebut the prima facie case of inherency set forth by the examiner.

Applicant further argues that Abe et al. fails to teach that the catalyst layer is zeolite free. However, Abe et al. clearly teaches and exemplifies a catalyst layer which does not contain zeolite. Therefore, it is the position of the examiner that the reference would meet the limitation zeolite-free.

Finally, applicant argues that Abe et al. fails to teach the claimed Si/Al ratio with sufficient specificity. However, the endpoint of the range taught by the reference is considered to be a specific example which would meet the claimed range. Therefore, it is the position of the examiner that claimed range is disclosed by the reference with sufficient specificity.

With respect to the rejection under 103(a) over Mizuno et al., applicant argues that the reference would teach away from using higher amounts of noble metal. This argument has been considered but is not persuasive. Mizuno et al. teaches that values

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higher than 700 g/cubic foot would result in reduced purification. However, it is the position of the examiner that using higher amounts of noble metal than exemplified, would be prima facie obvious since Mizuno et al. teaches that noble metal in the range of 10-700 g/cubic foot is suitable. Using a higher amount of noble metal (but still within the disclosed range) in combination with the non-noble metal loading exemplified would meet the range instantly claimed.

Applicant further argues that Mizuno et al. fails to teach that the catalyst layer is zeolite free. However, Mizuno et al. clearly teaches and exemplifies a catalyst layer which does not contain zeolite. Therefore, it is the position of the examiner that the reference would meet the limitation zeolite-free.

Applicant argues that inherency is relevant only to anticipation and not in establishing obviousness. This argument has been considered but is not persuasive. It has been held that the inherent teaching of a prior art reference, a question of fact arises both in the context of anticipation and obviousness. *In re Napier*, 55 F3d 610, 613, 34 USPQ 2d 1782, 1784 (Fed. Cir. 1995). In *Napier*, the Court affirmed a 35 USC 103(a) rejection based in part on an inherent disclosure in one of the references.

Applicant argues that the Labarge reference does not cure the deficiencies of the Mizuno reference because the reference does not relate sodium sites to sodium concentration. However, the Labarge reference discloses that high silica zeolites have very few sodium sites available for exchange. Because the only sodium in the zeolite would be in the exchangeable cation sites, there is a direct relationship between the available sodium sites and the sodium concentration, i.e. few sodium sites would

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necessarily lead to low sodium concentration. Applicant has not presented any evidence tending to rebut the prima facie case of inherency set forth by the examiner.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Ildebrando whose telephone number is (703) 305-0469. The examiner can normally be reached on Monday-Friday, 7:30-5, with Alternate Fridays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-33183318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

CAI
November 22, 2003

Riley Storer A.4.1725

Riley Storer 12/1/03